

What is claimed is:

1. A signal detector circuit comprising:
  - a. a peak detector that receives as input spectral information for successive time intervals of activity in a frequency band, detects one or more peaks in the spectral information and outputs information identifying peaks for each time interval; and
  - b. a plurality of pulse detectors each coupled to receive as input the output of the peak detector, wherein each pulse detector detects signal pulses that satisfy one or more characteristics based on the output of the peak detector.
2. The signal detector circuit of claim 1, wherein each pulse detector detects pulses that are within ranges of any one or more of: bandwidth, center frequency, duration.
3. The signal detector circuit of claim 1, and further comprising a control register that stores control information to set the characteristics for each pulse detector.
4. The signal detector of claim 1, wherein the plurality of pulse detectors simultaneously detect signals pulses of different types, wherein each pulse detector is configured to detect signal pulses of a particular type.
5. The signal detector circuit of claim 1, wherein the peak detector detects a peak as power values above a threshold at a contiguous set of frequencies.
6. The signal detector circuit of claim 5, wherein the peak detector receives as input Fast Fourier Transform (FFT) values for a plurality of frequency bins and comprises a comparator that compares power at each frequency bin with a peak threshold to identify which frequency bins exceed the peak threshold.
7. The signal detector circuit of claim 6, wherein the peak detector identifies the maximum power value among a set of contiguous frequency bins that exceed the peak threshold.
8. The signal detector circuit of claim 7, wherein the each detector receives as input the information from the peak detector that identifies which frequency bins exceed the peak threshold and maximum power value for a set of contiguous frequency bins that exceed the peak threshold and determines whether that information satisfies the one or more characteristics.

9. The signal detector circuit of claim 1, wherein the pulse detector is configurable as to under what conditions a start of a pulse is to be detected and under what conditions a pulse is to be considered terminated.
10. The signal detector circuit of claim 1, wherein each pulse detector is configurable to detect the start of a pulse if a peak output by the peak detector is within minimum and maximum ranges for power, center frequency and bandwidth.
11. The signal detector circuit of claim 1, wherein each pulse detector is configurable to determine that a pulse has terminated if, a period of time after a pulse is initially detected, a bandwidth and/or center frequency of none of the corresponding detected peaks from the peak detector are within a predetermined amount of the bandwidth and/or center frequency when the peak was initially detected.
12. The signal detector circuit of claim 11, wherein the pulse detector outputs pulse information describing characteristics of a pulse if the duration of the pulse exceeds a duration threshold value.
13. The signal detector circuit of claim 1, wherein the pulse detector outputs pulse information including center frequency, bandwidth and duration for each detected pulse.
14. A system comprising the signal detector circuit of claim 1, and further comprising a storage buffer responsive to the trigger signal that stores digital signals representing samples of a received signal in the frequency band.
15. The system of claim 14, wherein the storage buffer further stores a timestamp signal identifying a time associated with an occurrence of the trigger signal.
16. The system of claim 14, wherein the storage buffer is a first-in-first-out buffer.
17. The system of claim 16, wherein the storage buffer continuously stores the digital signals and stops storing in response to the trigger signal.
18. The system of claim 17, wherein the storage buffer stores the digital signals for a period of time after the trigger signal.
19. A system comprising:

- a. a Fast Fourier Transform (FFT) block that receives as input a digital signal representing activity in the frequency band and computes FFT values for a plurality of frequency bins for a time interval; and
- b. a power calculation block coupled to the FFT block that computes the power at each frequency bin at each time interval, wherein the power is supplied as input to the peak detector;
- c. a peak detector that receives as input output of the power calculation block for successive time intervals of activity in a frequency band, detects one or more peaks in the spectral information and outputs information identifying peaks for each time interval; and
- d. at least one pulse detector coupled to the peak detector, the pulse detector detects signal pulses that satisfy one or more characteristics based on the output of the peak detector.

20. The system of claim 19, and further comprising a memory that stores one or more of:

- a. a running sum of the power at each frequency bin over time intervals;
- b. a duty count comprising a running sum at each time interval of the number of times the power at each frequency bin exceeds the power threshold;
- c. a maximum power for each frequency bin for the current and prior time intervals; and
- d. a running count of the number of time intervals in which a certain number of peaks have been detected.

21. The system of claim 19, and further comprising a memory controller coupled to the memory, wherein a pulse detector outputs a trigger signal in response to detecting a certain type of pulse, and wherein the trigger signal is coupled to the memory controller to write to the memory the output of the power calculation block for one or more time intervals.

22. The system of claim 19, and further comprising an RF receiver that downconverts signals received in the frequency band to a baseband signal and an analog-to-digital converter coupled to the RF receiver that converts the baseband signal to a digital signal, wherein the RF receiver is configurable to operate in a wideband

mode whereby it downconverts energy in the entire frequency band, or in a narrowband mode whereby it downconverts energy in a portion of the frequency band.

- 23. A method for detecting signal pulses comprising steps of:
  - a. detecting one or more peaks in spectral information representing activity in a frequency band;
  - b. detecting signal pulses that meet one or more characteristics from the detected one or more peaks; and
  - c. outputting for each detected signal pulse, one or more of the power, bandwidth, center frequency and duration of the signal pulse.
- 24. The method of claim 23, wherein the step of detecting a peak comprises detecting power values above a threshold at a contiguous set of frequencies.
- 25. The method of claim 23, wherein the step of detecting a peak comprises detecting power values that exceed the threshold at contiguous Fast Fourier Transform (FFT) frequency bins.
- 26. The method of claim 23, and further comprising the step of providing for each detected peak, data including the maximum power value for each peak and frequency bins spanned by the peak.
- 27. The method of claim 23, wherein the step of detecting a signal pulse comprises detecting, from the peaks, signal pulses of multiple types using an associated set of ranges for one or more of bandwidth, center frequency and duration.
- 28. The method of claim 23, and further comprising the step of storing digital signals representing samples of a received signal when a pulse of a particular type is detected.
- 29. A processor readable medium encoded with instructions that, when executed by a processor, cause the processor to perform steps of:
  - a. detecting one or more peaks in spectral information representing activity in a frequency band;
  - b. detecting signal pulses that meet one or more characteristics from the detected one or more peaks; and

- c. outputting for each detected signal pulse, one or more of the power, bandwidth, center frequency and duration of the signal pulse.
- 30. A method for buffering digital signals representing samples of received radio frequency energy in a radio frequency band, comprising a step of, storing the digital signals and data indicating time of occurrence of the digital signals in a first-in first-out buffer in response to a trigger signal.
- 31. The method of claim 30, wherein the step of storing comprises continuously storing the digital signals and stopping storage of the digital signals in response to the trigger signal.
- 32. The method of claim 30, wherein the step of storing comprises storing the digital signals for a period of time after the trigger signal.
- 33. The method of claim 30, wherein the step of storing comprises storing the digital signals for a period of time after a first trigger signal and stopping storage of the digital signals in response to a second trigger signal.